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sile, upon a very thick filament not unlike the base of an ordinary ovary. This view of the centrally located stamen, sometimes actually surrounded by the pistils, is supported by the observation of a modified form combining the characteristics of both stamen and pistil. For example, an organ was found with one lobe complete, while the other terminated midway, being replaced below by a row of ovules.

Figure 1 shows an ordinary *Petunia* pistil; at figure 2 is seen one much swollen, and figure 3 exhibits a well developed specimen of the remarkable doubling. The upper portion consists of protruding, highly colored petals, while in the center of all is seen the secondary pistil. At *a* is the style and stigma of the primary pistil.

Figure 4 exhibits one of these stamen-pistils with the anther lobe conspicuous upon the right hand, and a number of imperfect ovules to the left and below.

In figure 5 is shown a section through a similarly deformed organ, with an ovule upon the left hand, and the anther lobe and pollen grains to the right.

From the size and central position, it is evident that these organs are metamorphosed pistils.

### Notes upon *Epigæa Repens*.

BY BYRON D. HALSTED.

Dr. Gray stated long ago\* that the trailing arbutus flowers are of two kinds, each with two modifications. The two sorts are characterized by the perfection or abortive nature of pistils and stamens respectively, and the modifications resided in the varying lengths of the essential organs. The two kinds indicate a decided tendency towards diœcism, and the modifications suggest dimorphism.

Of sixty flowers. from as many plants, examined recently, forty had the stamens predominating, and in these, sixteen had the style longest, fourteen with the stigmas and anthers even, and ten having short styles. In the remaining twenty, with strong pistils, eleven had the style shorter and nine longer than the filaments. It is evident that while there is a hint of dimorphism it is not far advanced. Many kinds of flowers exhibit equally great variations and are not dimorphic. More than this, if dimorphism was prevailing we should expect to find a difference in the size of pollen between the short and long stamens, but this is not apparent. There are not two sizes as found in dimorphic flowers. It seems evident that but little stress should be laid upon the sug-

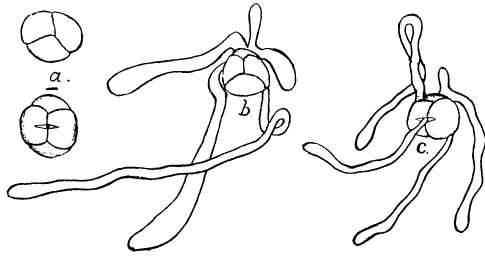
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\*Am. Jour. Science, July, 1876: Am. Nat., Aug., 1876.

gestion of dimorphism in this species, as the strong tendency to become unisexual is in large part sufficient to account for the greater robustness of pistil or stamen, as the case may be, which may readily include length of style or filament.

The point uppermost in Dr. Gray's mind in publishing his observations seems still undetermined, namely: "to ascertain, if possible, whether the short-stigma blossoms ever set seed." In other words, whether there is an approximate diceism simply, or a tendency toward dimorphism yet imperfectly attained.

The pollen of the *Epigæa* was germinated with ease in nutrient solution, and as the grains, like nearly all of the order, are united in fours, it is of interest to show that all quadrants are equally active in producing tubes. Two of the grains are shown at *a* before germination, while at *b* and *c* are seen two others that have sent out four tubes, one for each quadrant. It has been found that the best nutrient solution for the growth of the pollen is often obtained by soaking mature stigmas in water.



### A Botanical Excursion to Asateague Bay.

By H. H. RUSBY.

ABSTRACT.\*

Asateague Bay is a shallow sound situated off the eastern Peninsula of Maryland near its southern extremity, and just at the boundary line between Maryland and Virginia. It is at present somewhat notorious as being the scene of the great oyster war now in progress. Near it lies the island of Chincoteague, especially noted for the fact that it bears a race of wild horses the origin of which is somewhat uncertain. These horses are known as "Beach Ponies," and are quite different in form, habits and powers of endurance from our ordinary horses, considerably resembling in these points the American mustang. Every year

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\* Read before the Torrey Botanical Club.